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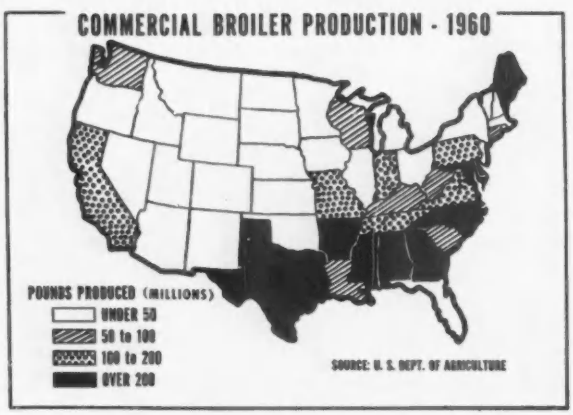
THE COMPETITIVE SIXTIES

Not long ago America's economists replaced the sobriquet "Golden Sixties" with the more sober-sounding tag "Competitive Sixties." It was not that they cancelled out their previous forecast of golden days ahead in the decade of the 1960's or retracted their predictions of future progress, but only a recognition of the facts of economic life. It has become obvious that those who produce and sell the nation's goods and services—farmers, manufacturers, and businessmen—would find the market challenge of the "Sixties" greater than in the decade just passed, and the search for profitable venture beset by the rising competition.

It is fundamental to a free economy that those who are willing to venture their savings on the sometimes perilous course of satisfying consumers should have free access to facilities and markets. How fully that right is exercised is evident from the fact that U.S. businessmen are pouring some $35 billion into new plants and equipment this year, a figure pretty close to the average of a number of years past.



Du Pont, a company that invented and commercialized nylon, has long since lost its position as sole producer and is faced by a half dozen domestic competitors and many more from abroad. The same story is true of many other products made by other large producers.

But, it isn't necessary to look to a major industry with multi-million dollar plants for examples of competition on the rise. The economic laws that affect industry are equally applicable to the farm. Take the case of the Arkansas broiler. Arkansas is rapidly increasing production of broilers. Although that tasty product from the state which styles itself the "Land of Opportunity" is not yet a factor in the East, Arkansas broilers are already sold as far as San Francisco.

It was not long ago that broiler production was largely the task of Maine, Connecticut, and the Delmarva Peninsula. These states supplied, each within its own radius, the vast north-eastern market. Local markets elsewhere were largely supplied locally. But, no longer. The largest broiler producer today is Georgia, with 300 million birds per year. Delmarva is second. Connecticut, which started out earlier, has since been replaced by Maine as number one in New England. More than 10 states have production of over 50 million birds per year, and seven produce over 100 million.

As a result, market frontiers of another day have been erased and competition from "outside" producers has become intensive, as in the case of southern producers who have aggressively pushed into the north-eastern market area.

Those who are able to meet that competition—broiler producers and nylon makers alike — will find that there is a lot of gold to be found in the "Competitive Sixties."

This publication contains information regarding new developments of interest to agriculture based on laboratory and field investigations by the Du Pont Company. It also contains published reports of investigators at agricultural experiment stations and other institutions as related to the Company's products and other subjects of agricultural interest.

WEATHER PERMITTING

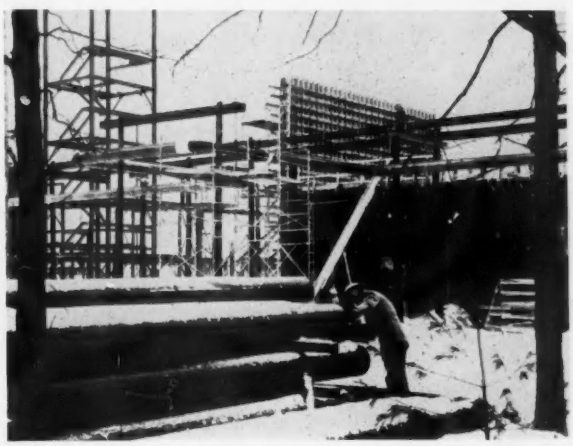
THE farmer whose lands are lashed by endless rain or scorched by drought, whose planting schedule is disrupted by late-season snow or whose harvest is injured by early-season frost might look with envy upon the modern industrial plant, whose steel and concrete seem unaffected by the vagaries of weather and climate. The fact is that weather often affects industry with the same suddenness and potential disaster that the man on the farm has faced since man first learned to plant a seed.

Industry must keep its weather-eye constantly cocked: Wind, rain, snow, drought, and humidity affect many operations of a company like Du Pont. Most dramatic perhaps is the closing down of explosives operations on the approach of a thunderstorm because of the potential hazard of explosion. A blizzard can keep a plant shut down for days, because employees cannot reach their place of work and shipment cannot be made. Excess heat or humidity may upset delicate chemical processes, while drought can cut off an adequate flow of water essential to plant operations.

A recent example of the effect of weather on industry is the closing down of Du Pont plants in the path of hurricane "Carla" earlier this year. Two plants directly in path of the storm were forced to shut down and suffered damage to such things as windows, power lines, and shingles. A third plant was closed at request of civil defense authorities when nearby roads became flooded.

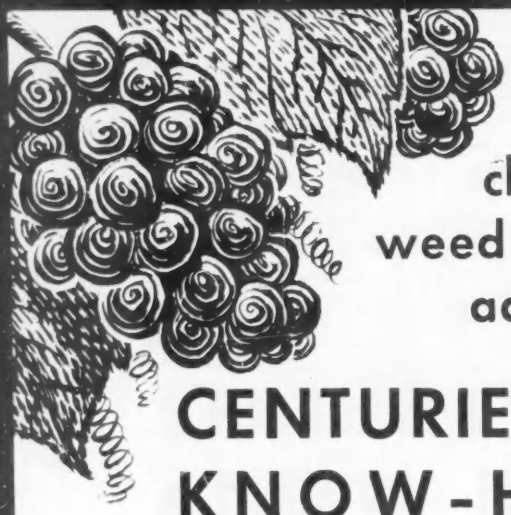
Even more significant can be the effect of weather on sales. A dry spring, for example, can halve the demand for a farm fungicide. A late winter cuts deeply into the sale of paints and other materials used in home building and maintenance. Drought which prevents crops from growing may bring a substantial drop in sale of pesticides and fertilizers. And a mild winter can leave unsold anti-freeze in the warehouse.

FARM CHEMICAL sales respond to weather. Rainy spring, for example, fosters development of apple scab fungus, affecting sales of "Thylate" thiram or other fungicides. Inventories must cope with the demand.



CONSTRUCTION is delayed by snow, rain. During building of Montague Works, Mich., snow fell on 104 of 167 days. Often depth was 17 inches. Winter can add five per cent to labor cost.

LIGHTNING can cause shutdown in explosive plants. Du Pont Company operator at Carney's Point, N. J., cuts switch to avoid costly production delays that might result from an unexpected power failure.



chemical weed control added to CENTURIES OF KNOW-HOW IN VITICULTURE

By Robert H. Leavitt

Herbicide Sales Promotion Supervisor
Industrial and Biochemicals Department
E. I. du Pont de Nemours & Co. (Inc.)

Grape culture, one of man's oldest agricultural enterprises, is being modernized with chemical weed control. Although there is great variation in the size of vineyard operations, and in specific cultural practices used on the world's 23,000,000 acres of grapevines, growers all face a common problem of controlling weeds.

As with other crops, weeds compete with grapevines for moisture and nutrients, and interfere with certain cultural operations such as harvesting. In order to realize maximum production, it is necessary to control these weeds.

Weed control has been accomplished for many years with hand hoes, harrows, and plows. Each year hand labor for hoeing becomes harder to find and more expensive. Capitalization required for the purchase of tractors, harrows, and plows also makes the standard tillage operations more costly. When as many as six tillage operations are required during a single season, the direct cost of cultivation can be high.

May Injure Vines

In addition, cultivation may cause direct injury to grapevines. Cultivating deep enough for effective weed control may cause serious root damage. Use of equipment on hillside plantings is not only difficult, but can increase losses by creating erosion problems. There is also the danger of damaging the trunks. For example, some growers report loss of five or 10 vines per acre each year, because mechanical injury to vine trunks increases susceptibility to collar rot. Most serious of all is the complete killing of vines caused by improper use or adjustment of a French plow. Damage to stakes and trellises may account for another significant expense each year.

It may cost $1,000 per acre or more to bring a new vineyard into commercial production. A healthy vine may produce for a longer period than man's average life span of three score years and 10. This high value per acre and long productive life have for centuries justified painstaking care of the soil and vines. Rising costs of operation, coupled with the realization that these hand and mechanical methods of tillage may contribute to reduced production, have encouraged growers to look for new methods of weed control.

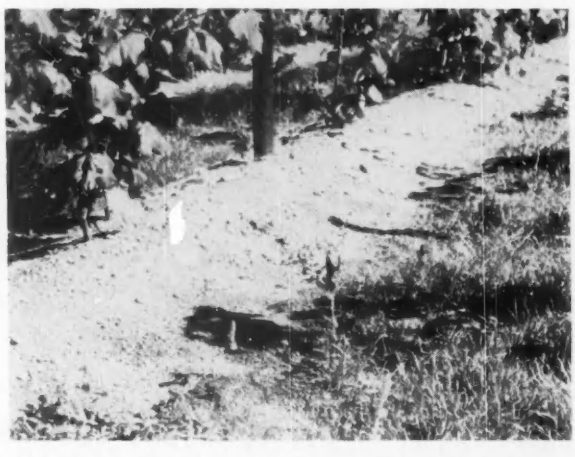
The development of contact weed killers helped alleviate some of the problems connected with cultivation in vineyards. These products, however, still had to be applied several times during the season in order to control each new flush of weed growth. In some cases, these materials were messy and not easy to use.

In the early 1950's, Du Pont developed a new herbicide which is called "Karmex" diuron weed killer. Early trials demonstrated that vineyards could be kept free of annual weeds with one or two applications per season. At rates which gave effective weed control, there were no unfavorable effects on vine growth, yield, taste, or quality of the fruit.

Weed Killer Recommended

Extensive test work throughout the major grape-growing areas was necessary before commercial registration could be accomplished.

"Karmex" diuron weed killer is now recommended for control of certain seedling annual weeds in vineyards that are at least three years old. Deep-rooted perennial or well-established annual weeds should be removed by cultivation or other means before chemical treatment, and the soil should be well prepared and as free as possible from trash and clods. Applications should be made as a band treatment to level or ridged soil in the grape row. Best results are obtained if the chemical is moved into the soil by moisture



EXCELLENT weed control is evident under grapevines where "Karmex" diuron weed killer was applied. Heavy growth of grass can be seen in the areas between the rows where no herbicide was applied.

(rainfall or sprinkler irrigation) shortly after application.

West of the Rockies, two pounds (per acre actually treated) should be applied in October or November for control of winter annual weeds. A second application, at the same rate, in March or April controls summer annuals. As an alternative, in most western areas, a single application of three or four pounds (per acre actually treated) can be applied in December, January, or February, for control of winter and summer annual weeds.

East of the Rockies, one early spring application is recommended annually, just prior to the germination and growth of annual weeds. On light, sandy soils and other soils low in clay or organic matter, "Karmex" should be used at two to three pounds (per acre actually sprayed). On soils high in clay or organic matter, the recommended rate is three to six pounds.

In New York State only, there is also a recommendation for use of "Karmex" in the cultivated area between rows as well as to the area under the trellis. For the area between the rows, rates of two to three pounds per acre are recommended. If the application between the rows and under the trellis is to be made in a single operation, nozzles with different delivery rates can be used to apply the two dosages simultaneously.

Commercial Experience

As with any new practice, growers are advised to make their first use of chemical weed control on a relatively small acreage. This will enable them to become familiar with application and performance of the chemical under their own local conditions.

There is, of course, an abundance of commercial experience with diuron under most grape-growing conditions in the United States and Europe. For example, in the Napa Valley of California, where high-quality wine grapes are grown, weed control with "Karmex" promises to eliminate most of the five tillage operations which are normally used.

Here it is customary to disk the vineyards twice—once along the rows and once across the rows. This has been followed by French plowing in the rows and an additional disking to throw the soil back to the base of the vines. Finally, hand crews remove suckers and hand hoe weeds at the base of each vine.

Speedier Coverage Possible

If the grapevines are valued at from $10 to $15 apiece, then the saving of two or three vines in 10 acres will pay for the cost of chemical used for weed control. In addition, there is substantial saving in labor costs, and the chemical can be applied in the slack period after pruning is completed. Substitution of chemicals for mechanical tillage on the hillside plantings makes weed control less costly and much easier.

In the San Joaquin Valley of California, one grower operating 850 acres of bearing vines, mostly for raisin production, formerly used 15 men for hand hoeing, plus three men for French plowing, all working for a period of three weeks. The French plows had to be handled carefully and could cover only 15 acres a day. Using "Karmex", it was possible to cover the entire 850 acres in three weeks with only two men and two spray rigs. Furthermore, once the rigs were calibrated, the job proceeded without the supervision required for the hand labor used previously.

In one irrigated vineyard, the grower reports that elimination of tillage has improved water penetration significantly. By using "Karmex" he has saved the cost of one irrigation and a number of tillage operations.

The evidence indicates that the use of chemical weed control can contribute measurably to increased profits in vineyards.

FRENCH PLOW, commonly used for mechanical weed control in vineyards often injures vine trunks, and may damage stakes and trellises. Chemical weed control reduces the danger of damage.

SPRING-LOADED rod strikes trunk to throw the plow out of the row as it passes each grapevine. Even in normal use, it often bruises the bark. This increases susceptibility of grapevines to collar rot.

BUILDINGS ON THE FARM

By Roger Newcomer*
Textile Fibers Department
E. I. du Pont de Nemours & Co. (Inc.)

Air-supported buildings first appeared about 15 years ago as radomes to protect long-range radar equipment from high winds and severe winters along the frontiers of North America. They could withstand wind velocities up to 125 miles per hour and temperatures ranging from minus 65° to plus 140°F.

The radome encompassed many structural and architectural features that have opened new vistas in the design of portable or semi-permanent buildings. Constructed of tough, lightweight material, the building is stiffened and stabilized solely by a small amount of air pressure. No interior support or framework is necessary. Required air pressure is low enough so that commercial ventilation blowers of small horsepower can be used to simultaneously support and ventilate the structure.

Nylon Used for Base

Because of the low cost, air structures have had their widest acceptance for industrial storage and warehousing. They can be quickly erected on a building site or over a partially completed project. Construction then continues inside, with men, machinery, and materials protected. Translucency provides daylight conditions inside, and insulation maintains comfortable temperatures. They can be folded into relatively small packages for ease of moving.

The choice of materials was limited in the early stages of pneumatic buildings. Several yarns had been developed but applications for structural fabrics were few. Prior to nylon's arrival, available materials had serious limitations, like too much stretch, low wet strength, poor tear resistance, poor coating adhesion, and weak resistance to weathering and sunlight.

The lightweight material or base fabric now in wide use is woven of nylon, created by Du Pont and commercialized in 1939. Over the years, Du Pont research people have improved nylon to the point where it has overcome these problems. And, improved weaving technology has brought about fabrics with a strength-weight ratio equal to that of structural steel.

Du Pont is a fiber producer and does not manufacture buildings. Because of the tremendous strength and resistance to rot and mildew of nylon, it has become an important base fabric for pneumatic buildings. Vinyl has become the most popular coating because it permits translucency. Neoprene coating is used where tranlucency is not required and where temperatures down to minus 40°F. may be experienced.

Coating for Low Temperatures

"Hypalon" synthetic rubber coating is also used for extremely low temperatures or where long-term resistance to ozone and weathering is important. It can be made in practically every color or shade, and in most light colors transmits working light. While vinyl and neoprene cost about the same, "Hypalon" is somewhat more expensive.

A collapsed barn roof due to heavy snow — resulting in destruction of farm equipment or possibly animals, re-building of the barn, and a cost hardship — could not happen to a pneumatic building. An air structure under heavy snow load may deflect and become misshapen but it will automatically return to its original shape as the load is removed. Air support gives the structure flexibility, but nylon's own flexibility and its great resistance to tearing play a valuable role in this. Should tearing occur, it is easily repaired by a cemented patch, providing for economy of maintenance.

Another important feature is that coated nylon fabrics will not support combustion—quite a consideration in many of today's farm buildings.

Structures Are Economical

Air-supported structures are economical and efficient for farmers. The cost of nylon air structures ranges from $1 to $1.50 per square foot of floor area. Rough cost estimates on a 110-by-225-foot athletic building with an air-supported roof were less than half of a similar building with a conventional roof supported by steel trusses. In general, the unit cost of air-supported structures decreases with size.

Durability depends on several things, including the coating material. Du Pont's experience at construction sites shows "Hypalon" is best because of high resistance to abrasion, sunlight, ozone, and chemicals. Other factors are: How long the building remains in one place, weather conditions, fabrication, and how many times it may be moved. Most manufacturers say the average life would be from five to seven years.

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* *Excerpts from an address before the annual meeting of the North Atlantic Section, American Society of Agricultural Engineers.*

Industrial Toxicologists:

WASTE FIGHTERS

MAN takes pride in keeping nature tamed, but "tame" is a relative word. Livestock losses to weather and disease total millions of head each year. The annual loss to plant diseases exceeds $3 billion. Insects destroy 12 per cent of all that U. S. farmers raise, and the nation's 170 million rats out-eat 10 million human beings. Add fire and flood, decay, and countless other hazards, and the conclusion is evident: Man can combat nature, but he is not yet its master.

Without scientific weapons, man would be in *real* trouble. Weed killers, wood preservatives, mold inhibitors, anti-freezes, germicides and similar products are among his major defenses against a very unhospitable environment.

Yet in recent years, there has been much concern over the possible hazards posed by these very safeguards. Critics note that they have become a major part of man's environment — in our food and clothing, and even in the air we breathe — and extremists have charged, outright, that "chemicals are poisoning us!"

The critics call for a "return to nature." But, the fact is that modern man, deprived of his scientific arsenal, would soon go hungry, ragged, and unhoused. Man cannot disown science and reject the benefits of his own intelligence; he cannot abandon himself to want. Instead, he must insure that science remains his servant and that its risks never outweigh its potential benefits.

The industrial toxicologist has assumed the task of providing this insurance, and the man and women shown at right represent a small sampling of Du Pont's pioneer effort in the field. They are staff members of the 26-year-old Haskell Laboratory for Toxicology and Industrial Medicine, located near Newark, Del. Part of Du Pont's large Medical Division, it was the first laboratory of its kind in the world and pointed the way for dozens of establishments throughout industry.

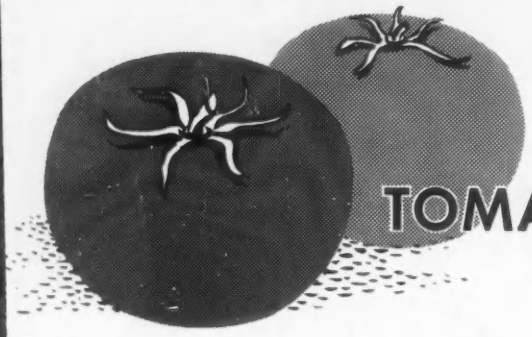
Today, with a technical staff of 25 and a million-dollar annual budget, the laboratory insures that Du Pont products under its investigation can, with reasonable precaution, be produced and used in total safety. Its studies cover about 125 new compounds each year, and its findings can mean the abandonment of even the most promising potential product. In sum, its work insures that progress is not made at the expense of safety.

In a nation which is often accused of wastefulness, the industrial toxicologist is the real "Waste Fighter," for the greatest waste of all would be the abandonment of the scientific tools which spell the difference between civilized man, who can fight nature to a draw, and primitive man, who cannot.

HISTOLOGY is specialty of Thomas Salthouse, shown preparing animal tissue for microscopic examination. Excess fat, or abnormal nuclear structure, would indicate damage by test compound in diet.

BIOCHEMISTRY section provides key talents for laboratory's overall effort. Chemist Katherine Ranta, shown preparing samples for Carbon 14 analysis, has been doing analytical work for 27 years at Du Pont.

HEMATOLOGY studies are conducted by Biochemist Joan Zerbe. Painstaking, long-term examination determines if test compounds have caused any disturbances of the animals' blood-forming system.



new developments in TOMATO GROWING PRACTICES

Developments which are revolutionizing tomato production include "climate insurance" through extension into more areas and use of plastic-film greenhouses, even in southern areas; direct seeding in the field; vine-ripening and trellis production; and above all, mechanical harvesting.

New developments in tomato growing practices are overcoming some of this crop's greatest production and marketing problems. Nevertheless, the insurance provided by a protective spray program still gives the best value for the tomato grower's dollar. In fact, some of the newest developments in tomato production either would not be possible or would not be worth the risk without sure control of late blight and other fungous diseases.

Geographical Extension

Large growers are extending their tomato production into more areas, to take advantage of climate variation to be able to supply high-quality tomatoes for the fresh market and processing over a longer marketing season. The frost-free Cuban production lost to the Castro regime is beginning to be offset by new plantings in the Bahama Islands and long-season trellis production in the frost-free area of the East Florida coast. At least one Florida grower has scheduled his plantings to provide steady movement to market from November 10 to May 20. Another has spread into South Carolina, to extend his marketing season beyond the end of Florida production.

More Greenhouses

In both Texas and Louisiana, plastic-film greenhouses are being tried for earlier winter marketing. The moderate Texas winter keeps the fuel bills downs, but occasional hot days have required development of a practical evaporative cooling system. Demand for vine-ripened greenhouse tomatoes is said to bring a premium price above green-wrap fruit.

Direct Seeding

Direct seeding in the field, which is an established practice in California, overcomes dependence on transplants and promises many other advantages, such as lower production costs per acre, better stands, no problem in transportation of plants, and elimination of rush work at planting. The biggest problem is weed control.

It may cost more to bring a seeded field to harvest than a transplanted field, because of the cost of the seed itself, and the necessary thinning and hoeing. Better yields can, however, be expected because the roots are not disturbed for transplanting, and there is no transplanting wilt, so the plants get a better start.

In Utah trials, yields and early production of direct-seeded tomatoes planted April 16 were comparable to transplants planted May 20. The seeded plants produced significantly higher percentages of No. 1 and No. 2 fruits, with considerably less cat-facing and fewer large cracks. A Pennsylvania report tells of three small fields of dwarf tomatoes seeded successfully in the field in Bucks County last year. A Michigan report tells of 30 tons per acre in a single harvest from direct-seeded plants, aimed chiefly at gaining mechanical harvesting information.

In South Florida, direct seeding in the hill has been increasing for the past four years. It can start September 1 and produce a crop in 90 days. The first 30-day period of the seedling's life in the field is not as critical as it would be in the seedbed, because the plants are not so thickly planted.

Vine Ripening

Another important trend is toward marketing field-grown vine-ripened tomatoes, with a considerable increase in trellis production in certain areas to make this more practical. Vine-ripe maturity is considered to be reached "when pink color was just breaking at the blossom end to one-half of the fruit surface showing color."

Trellis Production

Trellis production has perhaps had its greatest acceptance in Palm Beach and Broward Counties on the East Coast of Florida, where the Gulf Stream comes closest to the coast and the temperatures are the warmest in the State. The chief advantage of trellis support over stakes is that the plant has stronger support and the trellises are more permanent, although they can be taken down for working the fields.

Vine-ripened tomatoes lend themselves to fancy retail packaging without need for holding in a cooling room. Each picking is generally a good yield, and Florida fields may be picked as many as 75 times. Disease control sprays become extremely important, however, in maintaining the four to five-month vine-life required for trellis success—and one Florida field of choice tomatoes on trellises has a record of being sprayed as much as 90 times in one season.

Texas and Mississippi are both expanding their vine-ripened production, and California has increased pink tomato production to about 70 per

cent of its total volume of fresh market tomatoes. Mississippi trial plantings have been picked successfully as many as 16 times.

Mechanized Harvesting

Most revolutionary of all developments in tomato production is the drive toward mechanized harvesting. At least four state universities, as well as equipment manufacturers and tomato processors, are working to perfect mechanical harvesters. The present machines harvest the entire plant and separate fruits from the vine, and then require manual sorting of desirable fruit into the delivery system.

In a California demonstration of a mechanical harvester last fall, over two thousand spectators saw a machine-equipped crew of 13 men do the work of 60 hand-pickers. This man-and-machine combination operated at the rate of six tons per hour for the demonstration, and has operated successfully at 10 tons per hour. At least six different machines were demonstrated before tomato men last year, and it is expected that every tomato grower will have an opportunity to see at least one harvester in operation this year.

Engineers are confident that machines will be ready for general use in California in 1962. Some Californians are predicting that if trial plantings of suitable varieties are successful this year, much of California tomato production could be converted to mehanical harvesting by 1962.

The pressure is on plant breeders to develop varieties specifically for mechanical harvesting — tomatoes that mature uniformly, with fruit tough enough to stand mechanized handling, and still retain profitable yields and market quality to suit discriminating buyers.

California growers have been trying a pear-shaped variety for mechanical havesting. But general preference seems to favor some new round varieties which, while not perfected yet, give growers an opportunity to experiment toward meeting the pressure for converting to mechanical harvesting. Improved round varieties for California mechanized operations may not be perfected and available commercially for another year or more.

Growers who hope to move into mechanized tomato production have little to guide them. Some of the problems are: Spacing of rows and of plants within rows, irrigation management, fertilization for rapid growth without prolonged set and green fruit, how to bring the crop to harvest condition at the proper rate, dates of planting, mechanical thinning, planting on beds, spray schedules, and weed control. All of these will vary under different soil and climatic conditions.

Yields Rise

Profitable yields are the final pay-off for all the advancement in production practices. Two good examples come from 1960 performance in Pennsylvania and New Jersey. Pennsylvania master tomato growers shattered previous yield records when 111 individuals qualified as 20-ton per acre producers. The previous record of 20-ton producers was 86 in 1958. In the three classes, based on total acreage grown, two of the top winners averaged over 31 tons, and the third averaged 29.5 tons on 26.6 acres.

New Jersey's 1960 tomato growing champion produced 35.54 tons per acre, the highest tomato yield ever recorded there. A total of 361 growers qualified for membership in the 15-ton tomato club last year.

Individual tomato plants are not, however, producing appreciably more tomatoes than they did 25 years ago. Allowing for today's closer planting, the old five-ton crop had a potential of 30 to 35 tons to the acre, but a big portion of them stayed on the ground because of damage from insects, diseases, and weather.

TOMATO GROWERS throughout the United States rely on regular applications of Du Pont "Manzate" maneb fungicide to protect their crop from the five most serious fungous diseases — early blight, late blight, Septoria leaf spot, gray leaf spot, and anthracnose.

Whatever disturbs the dreams of the sleeping city, it is not the fact that virtually nothing man can eat grows in the shadow of this island of stone. The city sleeps, confident that a new day will feed it.

On the farm, wherever it is, sunrise answers the question the city dweller never thought of asking. For the farmer knows he can produce. This fact can be seen in the fertility of his fields.

Using the energy of the sun, and the simple elements of the earth, the plant builds up the complicated chemicals for life and growth. But, other creatures besides man are dependent for their survival on nutrients plants make.

The insects take the move — in untold n there are some 10,0 ranked as public en legion and their ap

The Unseen Harvesters

Knowing that his existence depends upon the chemical "industry" operating within plants, man labors to gain a better understanding of this complex process and find ways of helping plants grow more abundantly. A new Du Pont color movie tells the story of these labors by the "unseen harvesters" and shows their results, in terms of a single compound — a weed killer whose research and development took 100 man-years and cost over $2.5 million. The actual researchers — the men and women who discovered the compound, studied its

The discovery of any agricultural chemical represents the answer to a question that man has put to nature, and the vast Du Pont Experimental Station near Wilmington is devoted to just such question.

Research is the beginning for any new agricultural chemical, and the research chemist never runs out of work in his search for chemicals that may have some use. In fact his problem, if he has one, is where to start.

Herbicide specialists study herbicide performance in the field. In each case, it must control weeds without damaging the crop. Moreover, it must do this on the different types of soil where these crops are grown.

Precise medical data question of safety. Life animals show how mu can be safely taken in information, the FDA s

hare. Everywhere they bers. In the U.S. alone species which can be es. Their numbers are tes are enormous.

Just as menacing are the diseases. When a farmer fails to take them into account, he can also lose his crop. For these diseases are just as hungry as the insects. And still the foes of the plants have not been numbered.

Weeds infiltrate the farmlands to monopolize the soil's supply of water and nutrients, starving the crops. Their relentless encroachment takes another mammoth bite out of our agriculture.

In the greenhouses of experimental stations, man is constantly seeking out ways to aid plants in the struggle against their predators and competitors. This enables man to devise chemicals to protect plants.

effectiveness, and proved the measure of its safety — tell much of the story.

The film emphasizes the care which goes into development of farm chemicals, especially the controls exercised by industry and government to assure safety to the consumer. The rest of the picture is related to the needs of agriculture and American society. Because of the broad coverage and especially the examples of results in the field, it took one-and-a-half years to produce the film. The basic "story line" of *The Unseen Harvesters* is illustrated in the accompanying quotations and illustrations from the picture. Prints may be obtained for showing to groups without cost. The 16 mm sound film runs 28½ minutes, making it suitable for half-hour television programs. For information or for loan of the film write to: Editor, *Agricultural News Letter*, Du Pont Company, Wilmington 98, Del. Please give two alternate dates, if possible, since the available prints may be in circulation.

o to answer the tories of scores of of the compound e diet. Using this a safe tolerance.

Every new chemical takes a special place in the battle against the competitors for our food — a battle that is fought above the long vistas of the truck farms, and among the fruit-laden trees of the orchards.

The rich reward of harvest time requires a profusion of machinery to bring it in. Relentlessly the machines engorge row after row of plants, stripping them of foliage and sorting out the crop.

In the city, the question of today's food remains unasked. No one will ask whether the city will be fed today. And the fact that no one does becomes the final tribute to the success of the unseen harvesters.

new PRODUCTS AND APPLICATIONS

Market experience with the use of "Vexar" plastic netting for packaging of produce indicates that the economy, ventilation, strength, and merchandising advantages of the colorful plastic net bags provide a new dimension in produce packaging. For example, sweet potatoes are now being pre-packaged successfully in three-pound consumer units. Because sweet potatoes deteriorate quickly, particularly in film bags, they have usually been sold in bulk. Experiments are also being made using "Vexar" as a sleeve for glass-packaged products. Tests indicate that such sleeving will provide insulation that permits smaller cartons for packaging, reduces in-transit breakage, and opens the door for automatic end-loading of cartons.

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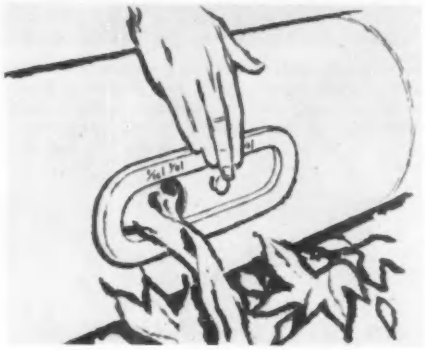


Synthetic rubber gasketing makes possible production of trouble-free flow gates in irrigation pipes for furrow irrigation. With the neoprene gaskets, the farmer has accurate finger-tip control of water flow with no worry about corrosion or failure through deterioration. Neoprene forms a tight natural seal as the gate is closed and the water pressure pushes the metal slide firmly against the gasket. Unlike natural rubber, the neoprene is not damaged by gravel or sand sometimes found in irrigation water. It also has superior weathering characteristics in desert sun or arctic cold, and it is not affected by ozone in the atmosphere or most farm chemicals.

* * * *

Diamond-edged knives that will slice metal to a thickness of half-millionth of an inch are available from the Du Pont Company in limited quantities for use in biological and metallurgical research. Tolerances obtained by mechanical means have traditionally been in the magnitude of one-thousandth of an inch. The knives were originally developed to meet needs within the Company's research program. They are of extremely high quality and can be produced in a variety of sizes up to one-quarter inch. The Company also provides a sharpening service. With these knives, it is now possible to prepare metal specimens for electron microscopic examination. For ordinary microscopic work, metal specimens may be prepared without the drudgery of grinding and polishing.

* * * *

Any farm household will find brushes made with Du Pont "Tynex" nylon filament can double as time and work savers in many applications. For example, a brush designed to glaze pastry will quickly butter quantities of toast for the hungry family, or provides an easy means of buttering corn. Pastry brushes may also be used to grease pans and muffin tins. A long, thin percolator brush can be used for cleaning narrow necked vases or teapot spouts. A brush-and-bottle combination designed for dishwashing is handy for cleaning rugs or upholstery. And, an added bonus is the fact that many of these small household brushes can be used to clean or oil small power tool or appliance parts.

* * * *

A machine only slightly larger than a typewriter folds polyethylene-coated cardboard blanks into heat-sealed cartons for packaging frozen foods, fruits, fish, and other products. Blanks are processed so the finished container has a polyethylene coating .75 mil inside and .5 mil on the outside. This permits heat sealing of the flaps for outstanding strength at container corners, the areas most vulnerable to damage. Blanks save from 25 to 35 per cent of the storage space for conventional folded cartons. Tests show the new cartons will hold water for 13 days or until evaporation is complete. Products do not stick to the polyethylene layer, and the containers cost less than equivalent six-corner-glued cartons.

The soggy paper plate which often made picnics or family get-togethers a trial is no more as a result of a new coating process. "Alathon" polyethylene resin bonded to paper plates eliminates seep-through since plates resist oils and moistures, and retain their original rigidity. Although plastic-coated plates have long been marketed, "Alathon" provides superior coating and protection. Clarity of the odorless, non-toxic polyethylene gives sparkle and sheen to paper plates. The convenience of the coated plate is such that many housewives have adopted them for regular indoor use.

* * * *

Recent additions to the rapidly developing "7" SEAS line of boat-care products is a trio of "shine-up" materials—fiberglass cleaner, boat wax, and boat polish. The boat polish is a general-purpose liquid for cleaning and shining all types of hulls, including those of fiberglass. One easy application produces a brilliant luster. Fiberglass cleaner is a mildly abrasive paste which safely removes small scratches, blemishes, and stains, restoring the original luster. The boat wax, which contains carnauba wax, beautifies and protects all types of marine finishes, including fiberglass.

* * * *

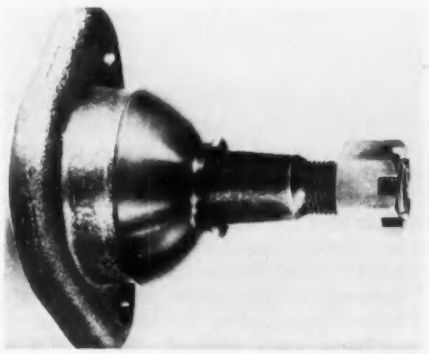
Of particular use around many types of farm machinery, automobiles, and trucks is a new do-it-yourself engine cleaner. Du Pont No. "7" Engine Cleaner and Degreaser makes it possible to easily clean engines, lawn mowers, and other types of equipment, as well as to remove grease spots from garage floors and other places. This new member of the Du Pont's automotive specialties line is easily sprayed on engines, and the grease is then quickly removed with water. The engine cleaner and degreaser requires no mixing, since it is available in a handy 16-ounce aerosol push-button spray can. The cleaner is also available in bulk quantities for large-scale commercial and industrial applications.

* * * *

Du Pont is constructing a pilot plant for the production of its new HT-1, high-temperature resistant polyamide fiber. The material shows great promise in such uses as electrical insulation, filtration of hot gases, special-duty belting, and for reinforcement of high-temperature hose. HT-1 is the product of more than 12 years of research in Du Pont's pioneering research laboratories. Du Pont spends some $90 million annually on research and development, of which about $16 million is for basic research.

* * * *

"Adiprene" urethane rubber has contributed its properties toward making possible an automobile that needs lubrication only once every 30,000 miles. The Du Pont elastomer is used in the Ford line to make a seal for front suspension joints to hold grease in and keep contamination out, despite the wear and tear of mud, ice, rain, bumpy farm roads, or chemicals on the highway. A number of problems had to be solved by automotive engineers to eliminate frequent greasing. Many service points were eliminated from cars and permanently lubricated plastic joints developed. Front suspension ball joints were adaptable to long-term retention of lubricant, but new grease had to be developed and a means found to seal in the lubricant.



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Mill products of columbium metal and alloys are now available from Du Pont's new Metals Center in Baltimore. Products include sheet, strip, plate, bars, tubes, and other shapes. Tantalum, tungsten, and molybdenum may be produced in the future. The Metals Center grew out of the Company's development program in refractory metals—metals which withstand unusually high heat and have other properties important in rockets, jet engines, and nuclear reactors. There are many potential applications where extreme temperature resistance and strength are needed. Du Pont is a leader in the technical and commercial development of titanium, the lightweight metal used in aircraft and chemical manufacture.

For Du Pont Agricultural Chemicals

NEW RECOMMENDA

Following are new or supplemental instructions for use of Du Pont agricultural chemicals, summarized from recent "supplemental label information." Complete information on any of these recommendations may be obtained from: Editor, *Agricultural News Letter*, Du Pont Company, Wilmington 98, Del.

Citrus — Weed Control: "Karmex" diuron weed killer is now recommended for selective control of annual weeds in citrus groves of most areas of California and Arizona, and all but four counties of Florida. Treatments should be made only to trees established for one year or more in the grove.

For California and Arizona, "Karmex" should be applied as a blanket spray at two pounds per acre soon after the grove is laid up in final form in late September or October. A second application, at the same rate, should be made in March or April to control germinating summer annual weeds.

In Florida a single application of four to six pounds of "Karmex" is recommended during any month of the year when seasonal rains are expected. Where "Karmex" is used in non-bearing orchards, it is suggested that treatments be made after winter banks are pulled down and the soil evenly distributed around the base of the tree.

A residue tolerance for diuron of one part per million in fruit and four parts per million in dried citrus pulp has been established.

Sugar cane — Weed Control: Recommendations for chemical weed control in Louisiana sugar cane with "Karmex" diuron weed killer and "Telvar" monuron weed killer have recently been expanded. These products are now recommended for either fall or spring application for control of certain germinating weeds. The recommendation applies only to plant cane seeded on fallowed ground. "Karmex" is generally the preferred product, but "Telvar" may give better results under certain conditions such as heavy soil or a predominance of the types of weed species which commonly germinate deep in the soil.

Pastures — Juniper Control: Ground juniper *(Juniperus communis)* can now be controlled with "Dybar" fenuron weed and brush killer in pastures and other non-cultivated areas east of the Rockies. "Dybar" at the rate of one to two tablespoons of pellets should be spread at the base of each juniper plant. Application may be made at any time, except when ground is frozen, but, for best results, application should be made in late winter or early spring.

Watermelons — Disease Control: The use of "Manzate" maneb fungicide for control of various fungous diseases of watermelons has been extended to the entire United States. It is recommended at 1.5 to 2 pounds per 100 gallons, for application as soon as plants begin to run, for control of downy mildew, anthracnose, Cercospora leaf spot, and gummy stem blight. Applications should be made at intervals of seven to 10 days, or more frequently under severe conditions.

Bananas — Disease Control: Control of crown rot, surface molds, and sigatoka disease in bananas is now possible with "Manzate" maneb fungicide. Sigatoka disease *(Cercospora musae)* is controlled during the growing season with "Manzate" fungicide in spray applications at two-week intervals. Crown rot and surface molds are controlled after harvest with a spray mixture of "Manzate" in water, applied to the harvested fruit. The fungicide treatment should follow passage through a hydrocooler or cleaning with water-rinse spray.

Cotton — Disease Control: Field studies, which were reported here earlier,* have led to registration of "Parzate" C zineb fungicide for prevention of cotton rust in the Southwest. The material can be applied as a spray at two pounds per acre in 20 to 40 gallons of water, or as a five per cent zineb dust at 30 pounds per acre. Three or four applications should be made at 10 to 14-day intervals, beginning at the first bloom stage, or earlier if general rains are forecast. Unusually heavy rainfall may demand additional applications. The chemical should be applied only before bolls open, and treated cotton foliage should not be fed to meat or dairy animals.

Peaches and Nectarines — Disease Control: Disease control recommendations for nectarines have been added to the Du Pont label for "Zerlate" ziram fungicide. For peaches, it is recommended for control of brown rot of blossoms and fruits, peach leaf curl, and shot-hole fungus. For brown

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*"*Zineb Prevents Cotton Rust*", Agricultural News Letter, *Vol. 29, No. 2, Summer 1961, page 8.*

TIONS . . .

rot blossom blight, "Zerlate" is recommended at 1.5 to 2 pounds per 100 gallons of spray at pink bud and again at 25 to 75 per cent of full bloom. The same rates are recommended for control of fruit brown rot, at petal-fall and again two weeks later, plus one or more additional applications at seven to 14-day intervals during the last month before harvest.

If the fungicide is applied within two weeks of harvest, residues should be removed by brushing or wiping the fruit.

Raisins and Currants: Fumigation of raisins and Zante currants with methyl formate is now permitted under a recently approved food additive tolerance. This is for control of certain storage insect pests, and no other fumigant use of methyl formate is presently recommended.

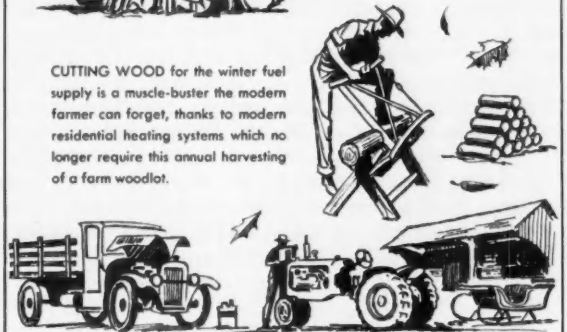
* * * *

AUTUMN LEAVES

meant many chores to farmers of a bygone day

CORN SHOCKING, which once contributed picturesquely to the fall farm landscape, is passing from the rural scene due to use of mechanical corn picking equipment and soil-building value of chopping and plowing-under the stalks.

CUTTING WOOD for the winter fuel supply is a muscle-buster the modern farmer can forget, thanks to modern residential heating systems which no longer require this annual harvesting of a farm woodlot.



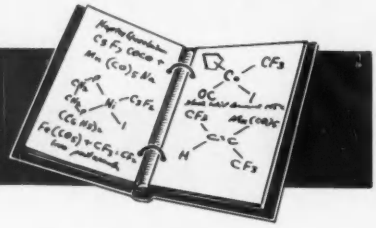
PUTTING IN ANTI-FREEZE each year is another fall chore that can be eliminated — by using an anti-freeze that can be left in the cooling system safely year after year. A new long-lasting product, "Telar" anti-freeze and summer coolant, can be put in the radiator at any time of year.

WEED CONTROL UNDER APPLE AND PEAR TREES

"KARMEX" diuron weed killer can be applied to the area around the base of apple and pear trees, as shown above. Application may also be made in bands along the orchard row, as pictured below.

Elimination of weeds under apple and pear trees conserves soil moisture and nutrients and leaves no hiding place for field mice and other rodents that damage trees. "Karmex" diuron weed killer is now recommended as an effective, economical, and easy to use method of eliminating annual weed growth under established fruit trees. "Karmex" should be applied at 4 pounds per acre of area actually sprayed in spring (March through May) just prior to germination of annual weeds. In areas such as the Far West, where there are separate winter and summer annual weed problems, it may be desirable to make a winter treatment (December to February) or to divide the treatment equally between a post-harvest fall application and a spring application. Patterns of application are shown in the illustrations.

Research Notebook



PHOSPHORUS FERTILIZER ACCUMULATION IN THE SOIL

For 42 years, superphosphate was applied yearly at 125 to 150 pounds per acre, and rock phosphate every four years at 500 to 1,000 pounds. Analyses of soil samples indicated in 1960 that research plots which received no fertilizer had 15 pounds of available phosphorus per acre in the top six inches, compared with 86 pounds for plots with superphosphate, and 314 pounds for plots with rock phosphate. Total phosphorus was 363, 522, and 754 pounds per acre, respectively. Phosphorus accumulated in the top six inches of the soil; there was no accumulation or movement into the 9 to 12-inch zone. Accumulation was reflected in yields in 1960 trials. Plots which had received no phosphorus from 1916 to 1958 averaged 5,697 pounds of sorghum forage per acre, plots with annual superphosphate 6,843 pounds, with rock phosphate 8.035 pounds. Cotton and wheat showed similar yield increases. — AGRICULTURAL EXPERIMENT STATION, OKLAHOMA STATE UNIVERSITY.

NEW GAS CHROMATOGRAPHY TECHNIQUE FOR MONURON AND DIURON

A highly selective method for simultaneously determining minute residues of monuron and diuron weed killer compounds with gas chromatography techniques has been developed experimentally. This is a broadened application, using a programmed column temperature operation in conjunction with non-selective ionization of thermal conductivity detectors.

Use of gas chromatography with monuron and diuron has been primarily for demonstration of techniques and special applications, rather than to replace colorimetric procedures. Even for mixtures of the two compounds, colorimetric-liquid chromatographic procedures recently developed by Du Pont will be probably adopted as routine techniques. Successful development of gas chromatography for monuron and diuron demonstrates its possible application where no analytical techniques exist or present ones are less satisfactory. With many compounds, accurate measurements can be made rapidly with gas chromatography because few preliminary isolation and separation steps are required. Furthermore, gas chromatography is uniquely suited for many different compounds, and for simultaneous determination of several components, such as isomers and homologs in one operation—E. I. DU PONT DE NEMOURS AND COMPANY.

NITROGEN FOR GRASS PASTURES

Many farmers in North Dakota have old pure tame or native grass pastures that have "runout" or become "sodbound" and unproductive, primarily because of insufficient available nitrogen for optimum forage production. In this study, nitrogen fertilizer was broadcast annually in late fall on a 25-year-old field of northern bromegrass from 1954 to 1959. This resulted in (1) more forage production, (2) increased protein content and protein production in forage, (3) approximately 10 days earlier grazeable growth in the spring, (4) faster and more complete recovery after harvest and in the fall, and (5) greener, leafier forage throughout the season.

The favorable economics of nitrogen fertilization of old stands of pure grasses are obvious. This appears particularly valuable to stockmen reluctant to graze on a grass-legume mixture because of bloat hazard; or to farmers interested in maximum product output per acre. Pure grass stands such as bromegrass should be fertilized with nitrogen every year as there is little residual effect from year to year from applications below 133 pounds of nitrogen per acre. — AGRICULTURAL EXPERIMENT STATION, NORTH DAKOTA STATE UNIVERSITY.

PROTECTING SORGHUM SEED STOCK

Valuable sorghum seed stock can be protected from English sparrows and other birds without hazard to the birds themselves through the use of "Arasan" 42-S thiram fungicide and repellent. This has been demonstrated in Texas tests, conducted cooperatively by the Texas Agricultural Experiment Station and the Denver Wildlife Research Center, Bureau of Sport Fisheries and Wildlife.* "Arasan" 42-S (at one to three gallons in 65 gallons of spray per acre) was one of three test chemicals hand sprayed on sorghum heads during the late dough stage. After treating, each test plot was enclosed in a 6 x 4 x 5-foot cage. Eight English sparrows were placed in each cage for two weeks. None of the test chemicals killed any of the birds. "Arasan" 42-S proved a highly effective repellent. Even when no other food was available, during the entire period, birds did not feed on treated seed. This is recommended for seed sorghum only since no residues are permitted in grain for food or feed.

**Field Tests of Three Chemicals as Bird Repellents on Mature Grain Sorghum,* Agricultural and Mechanical College of Texas, Texas Agricultural Experiment Station, June 1961.

HARVESTING FAILS IN FALLOUT REMOVAL

Radioactive fallout cannot be removed effectively from farm land by harvesting crops. Harvesting removed only about one-fourth of simulated fallout applied on isolated field plots planted with soybeans, representative of broadleaved plants, and dusted with simulated fallout. Rye was later used in a similar experiment. Plots were dusted with various concentrations of barium 140. This isotope has a relatively short half-life, thereby freeing plots for repeated use, while providing information about other types of radioactive particles that remain dangerous for months or years. Decontamination was attempted with a machine that cuts and picks up the soybean crop in one operation, and by the standard method of mowing, raking, and baling. Some plots were vacuum-cleaned with a specially built machine both before and after harvesting. The greatest amount of fallout (35 per cent) was removed by the direct-cut harvester. Vacuum cleaning before harvest was not successful. — USDA.

HIGH NITROGEN GRASS

Alfalfa is difficult to establish and relatively short-lived in eastern Connecticut, southern New York, and northern New Jersey where there are 3.5 million acres of Duchess shaley and associated soil types. On the other hand, grasses are easier to establish, are better adapted to this type of land, and have been found to respond to nitrogen fertilization in yield and chemical composition.

Reed canarygrass hays fertilized with 0, 100, and 200 pounds of nitrogen per acre were fed to dairy heifers to assess nutritive values compared with standard forage second cutting alfalfa. With 200 pounds of nitrogen it was equal or superior to alfalfa hay in the digestibility of protein, fiber, ether extract, and digestible energy. This gives further proof that the nutritive value of grass hays can be increased with nitrogen. Studies concerning the yield and milk-promoting ability of nitrogen-fertilized grass hays are being conducted. — AGRICULTURAL EXPERIMENT STATION, RUTGERS UNIVERSITY.

FRUIT ROT CONTROL IN STRAWBERRIES

A good way to increase strawberry yield is to spray for fruit rot. Spraying or dusting does not eliminate fruit rot completely, but reduces it. Sprays usually give better results than dusts — but a thorough dust job is better than a sloppy spray job. Fruit rot is severe only in years when rainy weather occurs during blossoming time and is most destructive when rains continue on into harvest. Since no one knows whether a year is going to be rainy or not, strawberry growers who expect to get 2 to 8 tons per acre consider spraying as insurance against extreme losses. Spraying is probably uneconomical for growers who do not expect yields greater than 1.5 to 2 tons per acre. —AGRICULTURAL EXPERIMENT STATION, OREGON STATE UNIVERSITY.

GROWTH RETARDANTS INCREASE PLANT SALT TOLERANCE

Growing of plants in highly saline soils may become possible if further research upholds early findings. Excessive accumulations of salts in the soil interfere with normal growth of crop plants in many areas of the country. In preliminary greenhouse studies, certain chemicals that retard plant-stem growth were also found to prevent salt damage. Soybean plants grown in soil made salty by excess fertilizer grew to maturity and produced some viable seeds when treated with retardants. Untreated plants wilted within 24 hours and died within three weeks. Three experimental chemical retardants were used. Each was applied to the soil at 38 milligrams per soybean plant, equivalent of 15 pounds of chemical per acre; one was also sprayed on foliage.

Seven to 12 days after treatment, fertilizer was applied at from four to eight grams per plant. Four grams per 3-inch pot is equivalent to about 7,800 pounds per acre. Fertilizer is not generally applied at these excessive rates in crop production and high rates are used in this reseach only because fertilizer is a convenient source of several different chemical salts. Chemically retarded plants treated with four to five grams of fertilizer were not damaged, but grew to maturity and produced viable seed. Yields were, however, low. Six or seven grams of fertilizer caused some damage, but the plants recovered and produced viable seed.

Untreated plants died when five or more grams of fertilizer were applied. Untreated plants receiving four grams of fertilizer were damaged, but recovered. Eight grams killed both plants.

Plant-growth retardants are generally used to produce compact plants, but scientists, who have been experimenting with these chemicals for nearly 15 years, are finding new uses for them. In addition to retarding plant-stem growth, retardants make leaves greener than those on untreated plants. In other experiments, bean plants treated with plant-growth retardants lived as much as 60 per cent longer than untreated plants. —USDA.

METHOXYCHLOR FOR HORNFLY CONTROL IN DAIRY CATTLE

Good hornfly control was obtained with 50 per cent methoxychlor wettable powder rubbed on the back of cows every two or three weeks. A four per cent malathion dust was not as effective; more frequent dustings were necessary and the cost was higher. For a 100-foot barn and 35 cows, the barn-spraying and cow-dusting program costs between $6.50 and $15.50 per season and controls both barn flies and hornflies. This was around 19 to 44 cents per cow in the summer of 1960. Cost for foggers is around $24.00 or 69 cents per cow, assuming about 10 ounces of spray daily.—COLLEGE OF AGRICULTURE, UNIVERSITY OF WISCONSIN.

TWO FRIENDS OF FARM YOUTH RETIRE

Two old friends and long-time associates in farm youth work retired on November 1. One is Dr. William T. Spanton, who for 21 years had been director of the agricultural education branch of the U. S. Office of Education, and National Advisor to the Future Farmers of America. The other is Clark W. Davis, general manager of the Du Pont Industrial and Biochemicals Department. For more than a decade, Mr. Davis has been a leader in the business community's support of FFA and 4-H programs.

Their joint and separate efforts were recognized each year at the national convention of the Future Farmers of America. They have also served together for several years in selecting the Star Farmer of America. Dr. Spanton has been a permanent member of the board of judges.

In Charge of Agricultural Chemicals

In 1956, Mr. Davis was chairman of the sponsoring committee for the FFA Foundation, the highest businessman's responsibility in the FFA program. He has been awarded honorary FFA degrees of American Farmer, State Farmer, and Chapter Farmer, as well as the New Farmer's Degree awarded by the New Farmers of America, and has been a frequent host to delegations of FFA and 4-H members visiting the Du Pont Company. He was also the prime mover in associating the Company with the National 4-H Beef Award Program, which is now in the fourth year of Du Pont sponsorship.

Mr. Davis was born on a farm in Gilmore, Neb., and joined the Du Pont Company 44 years ago as a chemist in the Explosives Department. He rose through various positions in the Explosives Department to manager of the military explosives division during the early years of World War II. In 1942, he was appointed assistant general manager of the Grasselli Chemicals Department, and moved up to general manager in 1951. He continued as general manager when the Industrial and Biochemicals Department was formed in 1959. This department has responsibility for most of Du Pont's research, manufacturing, and sales in agricultural fields.

Mr. Davis holds several patents for chemical inventions and is a member of Sigma Xi honorary scientific research society. He is also an associate trustee of the University of Pennsylvania, and chairman of the University's Council on Veterinary Research.

Reared on Farm

Dr. Spanton was born in Kentucky and reared on a farm in Ohio. After graduating from Ohio State University, he taught agriculture and science in Ohio high schools, and then became state supervisor of agricultural education, first in Rhode Island and then in Missouri. In 1925, he became the federal agent for agricultural education for the Pacific region. This was the early period of the formation of vocational agricultural classes in high schools under the provisions of the Smith-Hughes Act.

The program led to local clubs and state organizations which joined together in 1928 to form the National Future Farmers of America. Dr. Spanton was one of the members of the original board of incorporators, and became National Advisor and director of the agricultural education branch in 1941.

Nearly 400,000 FFA Members

The blue and gold FFA jacket is now proudly worn by nearly 400,000 boys. At each official meeting, local chapter, state association, or national meeting, each officer is stationed at his post — the president by the rising sun, the secretary by the ear of corn, the treasurer by Washington's picture, the vice president by the plow, the reporter by the flag, and the advisor by the owl. When it is the advisor's turn in the ceremony to tell why he is so stationed, Dr. Spanton has answered in the national convention each year, "The owl is the time-honored emblem of knowledge and wisdom. Being older than the rest of you, I am asked to advise you from time to time as the need arises. I hope that my advice will always be based on true knowledge and ripened with wisdom."

He has been giving advice to farm boys and their adult leaders — based on true knowledge and ripened with wisdom — for over 45 years. To his associates, like Clark Davis, in the business world, he has personified the dedicated, professional, adult leadership which has made the FFA program so successful.

Succeeded by W. E. Gordon

Mr. Davis's successor is Wallace E. Gordon, who had been assistant general manager of the Du Pont Industrial and Biochemicals Department. Dr. Gordon has also participated extensively in the Company's sponsorship of farm youth activities.

Dr. Spanton is succeeded by Dr. A. Webster Tenney, who was National Executive Secretary of the FFA for 14 years, and during eight of those years also administered the vocational agricultural education program for the 13-states which comprise the Central Region.

Here Is the Answer . . .

Q: How much of a "cost-price squeeze" is affecting industry?

A. In Du Pont, for example, sales prices are down below the 1947-1949 average, while price of products purchased is up three per cent and wages rose 85 per cent.

* * * * *

Q: Which causes more damage to forests, pests or fire?

A: Insects and diseases kill an estimated seven million board-feet of timber annually, more than all other causes, including fire, combined.

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Q: Is it true that food fat consumption has dropped drastically in recent years?

A: No. Food fat consumption is higher than 25 years ago, but "invisible" fats (in dairy products, meat, eggs, etc.) account for 60 per cent of the total.

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Q: Can dogs transmit any disease to man?

A: There are more than a dozen diseases that can be transmitted or harbored by dogs, including rabies, ringworm, and leptospirosis.

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Q: What is the first recorded use of chemical pesticides?

A: Homer mentioned "pest-averting sulfur" one millennium before Christ. In 470 B.C., the Greek philosopher Democritus recommended a blight cure made of olives; while Pliny, the Roman, in 60 B.C., suggested soaking wheat seed in wine to prevent mildew.

* * * * *

Q: How much time could the housewife save by using completely prepared food?

A: Three ready-to-serve meals per day would eliminate about four hours of work time compared with home-prepared food, and the cost would be $6.70 against $4.50.

* * * * *

Q: How much less human effort does it take to produce farm products today than 40 years ago?

A: One hour of farm labor produces four times as much, but, of course, there has been a substantial rise in the input of other factors of production.

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Q: Does Du Pont depend heavily on defense contracts?

A: Not at all. In 1960, Du Pont, although the country's largest chemical company, was 52nd on the list of defense contractors, with $55 million (less than .03 per cent of sales).

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Q: Is it true that women do a large part of the home painting in this country?

A: A Du Pont survey found that more than 50 per cent of all interior paint sold for consumer application was in fact painted on by women. One reason for this trend is the new non-spatter, easy-clean paint called "Lucite" wall paint.

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Q: How many pesticides are on the market?

A: More than 9,000.

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Q: Why does meat darken near the bones of chickens?

A: A VPI report says modern rations mature poultry so quickly that bone is calcified at nine weeks. This liberates blood hemoglobin when young birds are frozen and thawed, which then leaks through the spongy wall, discoloring bone and surrounding meat.

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Q: Is the rate of nylon use for tire-cord still increasing?

A: Yes, almost 50 per cent of passenger-car replacement tires sold last year used nylon, compared with 20 per cent in 1956. The rate is higher in truck and bus tires.

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Q: How much of an effort does Du Pont make to insure safety in its plants?

A: There is a highly organized safety program at all installations. The Company has received 16 Awards of Honor from the National Safety Council, a record.

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Q: How significant is the contribution of a major industry to the local economy?

A: Here is an example: Du Pont poured some $64 million into the economy of New York last year, including $38 million in payrolls and $26 million in purchases from about 3,200 firms located in the State. During the past 10 years, more than $1.2 billion in buying power was generated in Virginia and West Virginia.

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Q: How much money is spent for agricultural research in the United States.

A: About $550 million per year, some 52 per cent of it money spent by industry.

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Q: How widespread is the use of farm chemicals today?

A: An Iowa survey found nine out of 10 farmers were using at least one agricultural chemical in their operations.

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